«Our» Internet

- what a glorious thing
- The future – «Pizza delivery service» for big Hyperscalers?
- what a lousy state it is in

«Our» Internet
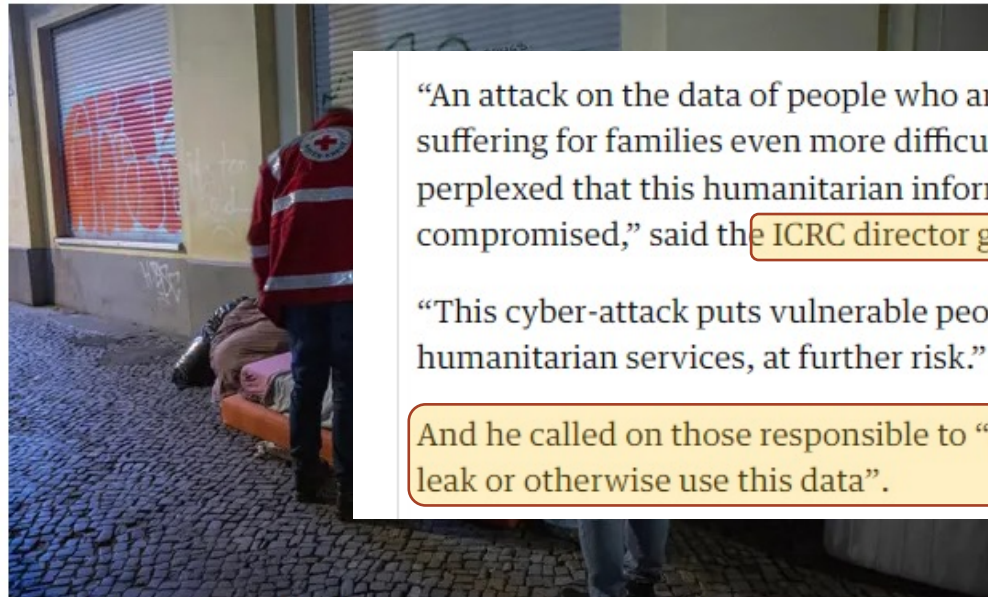

International Committee of the Red Cross (ICRC)

Agence France-Presse

Wed 19 Jan 2022 23.18 GMT

Hacking attack on Red Cross exposes data of 515,000 vulnerable people

Global headquarters forced to shut down computer systems for programme that reunites families separated by conflict

"An attack on the data of people who are missing makes the anguish and suffering for families even more difficult to endure. We are all appalled and perplexed that this humanitarian information would be targeted and compromised," said the ICRC director general, Robert Mardini.

"This cyber-attack puts vulnerable people, those already in need of humanitarian services, at further risk."

And he called on those responsible to "do the right thing – do not share, sell, leak or otherwise use this data".

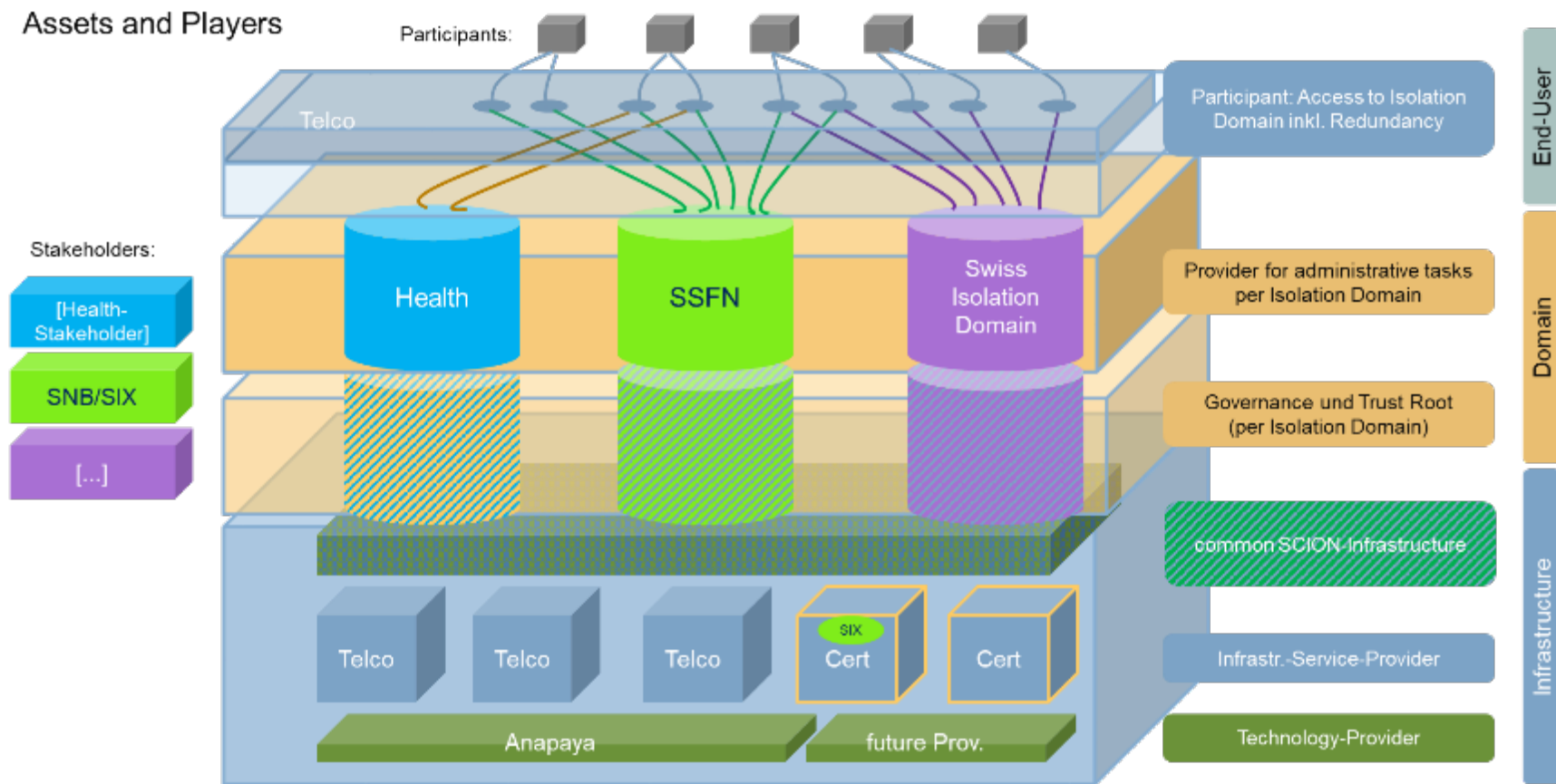The Red Cross has been hacked Photograph: Christophe Gateau/AP

The International Committee of the Red Cross has been the victim of a cyber-attack in which hackers seized the data of more than 515,000 extremely vulnerable people, some of whom had fled conflicts.

«Our» Internet

- what a glorious thing

- The future – «Pizza delivery service» for the Big 5 Hyperscalers?

- what a lousy state it is in

- the vastness, lawlessness and lack of responsibility of «our» Internet allows for such infamous actions

➢About 5 years ago some of us started to look into SCION …

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"Our" SCION-based Infrastructure and the SSFN

- a visualisation which came up over time

- I will use it later on again

- SSFN – "Secure Swiss Finance Network"
  - Telcos: Swisscom, Sunrise/UPC, SWITCH
  - Participants – the first on board: ZKB, Raiffeisen, UBS, SNB, SIX
  - Voting Members: SNB, SIX, SWITCH
  - Cert-Provider: SIX, SWITCH
  - "Product Owner" SSFN: SIX, with major contributions regarding Project Management and Efforts regarding diff. aspects

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SCION-based Infrastructures: two realms involved

- of course: the **technological** realm of SCION

- but: there is also a **sociological** realm with aspects of

  - common grounds and targets,
  - working relationships and cooperative actions,
  - a Culture of Common Ideas and Agreements

regarding the last aspect: Is a "Culture" a mere result of grounds and action?

my point for the next minutes:

A "Culture"
- is not just a "nice to have" or an outcome
- but is an essential **basis** for the functioning of SCION-based Infrastructures and special Isolation Domains/Community Networks like the "Secure Swiss Finance Network SSFN"

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Let's make a short detour ...

- in the recent pandemic -> the ability to work from remote became essential

- we probably all experienced that **it worked quite well**
  - **not** because of an atmosphere of control, coercion and micro-management
  - **but in a "culture of shared understanding, shared identity and psychological safety"***

* which is a direct quote of Professor David Burkus, an expert on organizational psychology,
from his excellent book "Leading from Anywhere"

Team members inside an enterprise need
- **shared understanding – who is the fellow in my team, do I know his "specialties"?**
- **shared identity – what are we fighting for?**
- **psychological safety – leaders act trustfully and with respect**

➢A Positive Culture is a Must in todays complex technology driven enterprises

- Can we carry over these "Culture principles" to SCION-Infrastructures and special-purpose Isolation Domains like the SSFN?

Enterprises versus SCION-Infrastructures and Community Networks

- a big difference for sure:
    - not "team members" but autonomous players with their own targets
    in the case of SSFN: banking institutions, telco providers, institutions like the SNB

- but one common: **Together they are 'fighting for' …**

- **a scarce resource!**

- not for water for irrigation or grass to feed their cattle, but the scarce resource which the SSFN is aiming at is

"protected data communication between autonomous and responsible players"

why is it scarce?
- **could not be a service of one telco provider for all – choice and flexibility are needed**
- **could not be the "open Internet" – as we know at the moment: "open" means "unprotected"**
- **It has to be created and protected like a "Common Pool Resource"**

- "scarce resources": -> **the realm of "Common Pool Resources"** or short "Commons"
(Gemeingüter, die Allmende)

- Let's have a brief look on Professor Elinor Ostrom and her work on "Governing the Commons"

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Professor Elinor Ostrom

DESIGN PRINCIPLES AND THREATS
TO SUSTAINABLE ORGANIZATIONS THAT MANAGE COMMONS

by

Elinor Ostrom
Center for the Study of Institutions, Population, and Environmental Change
Workshop in Political Theory and Policy Analysis
Indiana University

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In 2009, she was awarded the Nobel Memorial Prize in Economic Sciences for her **"analysis of economic governance, especially the commons"**. She was the first woman to win the Nobel Prize in Economics. (source: Elinor Ostrom – Wikipedia)

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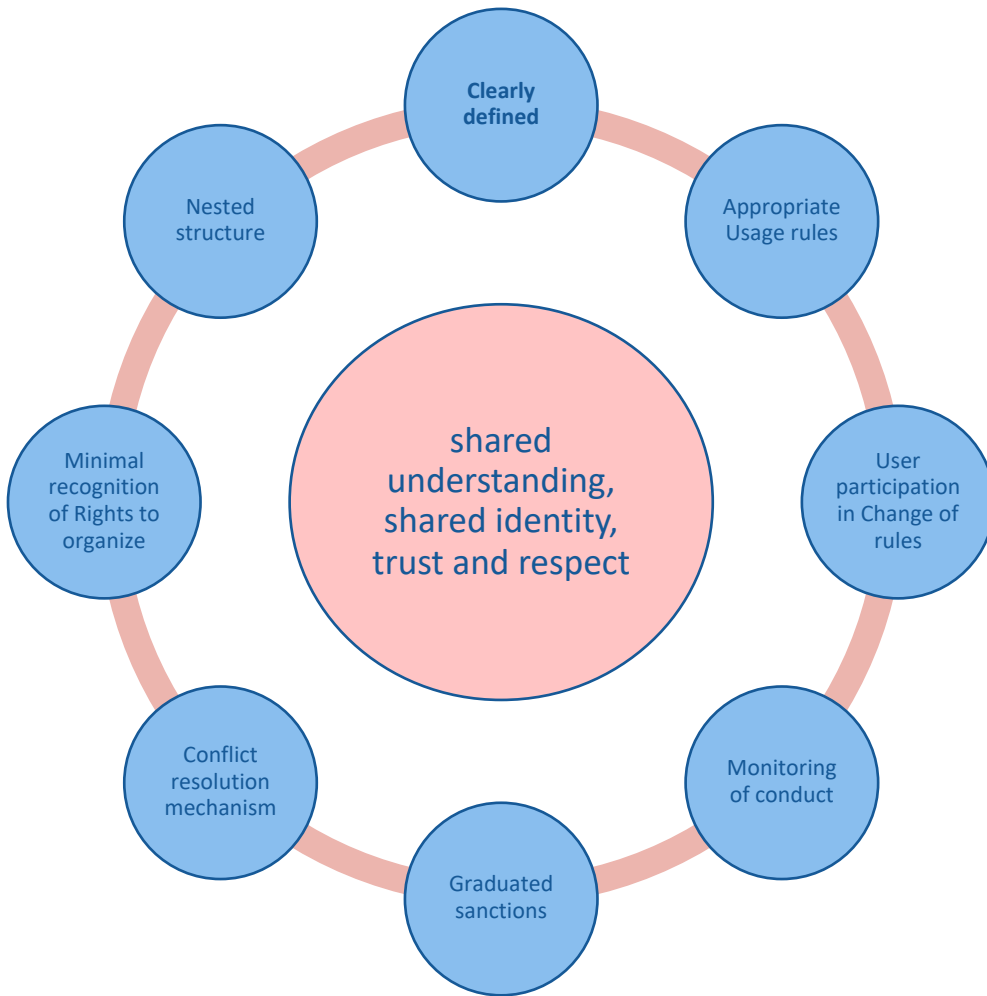AWK Group
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The Governing of the Commons

- Professor Elinor Ostrom spent years of field research on water cooperatives in California and other common pool resource-organizations world wide

- She rejected scientifically the theory of "the Tragedy of the commons":

  The biologist Garrett Hardin stated that the rational approach of humans to use common pool resources like fishing grounds, forests or water for irrigation would inevitably lead to the depletion and destruction of these resources.

  The only way to keep these resources alive could be privatization or a strict and forceful regulation by state agencies.

- Professor Ostrom's research showed

  - **in many regions of the world, in different cultures**
  - **autonomous users manage common pool resources (CPR) on rational grounds**
  - **so that the resources are used in a sustainable way.**

- Her work focused on the **design principles of functioning CPR-organisations** and also on the threats which lead to failing efforts.

The Design Principles of stable common pool resource management

Design Principle	In short	Examples and remarks
Clearly defined boundaries	who is allowed to use the scarce resources	Allowed users of grassland
Appropriate Usage rules	When, how much or how often, what fees to be paid	How many animals, when to send, what to pay; highly dependent on local conditions
Participation in Change of rules	Collective discourse on adjusting rules when needed	Participation in discourse enhances acceptance of users
Monitoring of conduct	Reliable monitoring on how users are behaving	Could be users themselves or appointed Monitors
Graduated sanctions	User not sticking to rules gets sanctioned	Observation how others are sticking to the rules enhances ones own compliance
Conflict resolution mechanism	The organization has formal or informal places to discuss and decide on conflicts	Important that at first these mechanisms are internal, not external
Minimal recognition of Rights to organize	The organization is accepted as a legally allowed and protected entity	This external acceptance of the rules strengthens the self-organizing capability
Nested structure	If the size of the organization gets too big, nested structures with more layers are seen	Typically invented from bottom up; higher layers have their own rules

Common Pool Resources – management and mindset -> "CPR MM"

Circular diagram with center: **shared understanding, shared identity, trust and respect**, surrounded by: Clearly defined, Appropriate Usage rules, User participation in Change of rules, Monitoring of conduct, Graduated sanctions, Conflict resolution mechanism, Minimal recognition of Rights to organize, Nested structure.

Arrow pointing to: **«CPR MM»**

- every CPR Organization is singular
- highly dependent on local conditions
- never develops «Top down»
- no «copy paste», no blueprinting
- regarding Government role:
  - general funding is contra-productive!
  - prescriptions and «smart planning from the top» do not work
  - but formal acknowledgement and legal protection are important
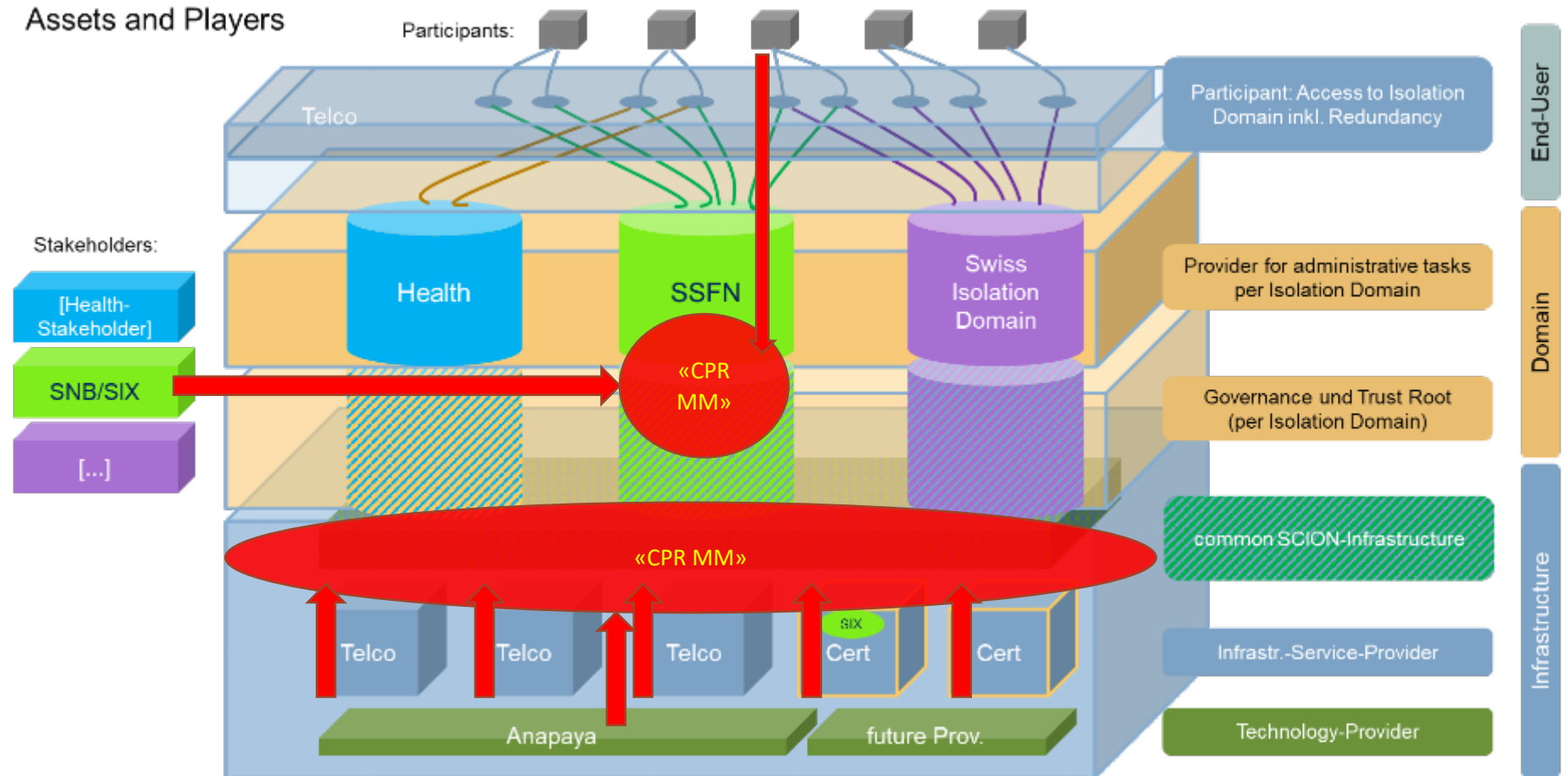
Where "CPR MM" is needed

- Common Pool Resources – management and mindset
  - shared understanding
  - shared identity
  - trust and respect

- needed on the "isolation domain"-Level
- needed on the SCION-infrastructure-Level
- these are not the same!

we have seen how "CPR MM" needed time to develop

- on the level of the engineers
- also on the C-level of the involved parties

As the "CPR MM" grew, things started rolling …

Assets and Players

Participants:

Telco

Stakeholders:

[Health-Stakeholder]

SNB/SIX

[…]

Health

SSFN

«CPR MM»

Swiss Isolation Domain

«CPR MM»

Telco   Telco   Telco   Cert   Cert

SIX

Anapaya   future Prov.

End-User

Participant: Access to Isolation Domain inkl. Redundancy

Domain

Provider for administrative tasks per Isolation Domain

Governance und Trust Root (per Isolation Domain)

Infrastructure

common SCION-Infrastructure

Infrastr.-Service-Provider

Technology-Provider

Let's wrap it up

- The state of the "Internet" at the moment is lousy and a hideaway for unspeakable crimes

- The positive nature of "Internet", to let decent people and enterprises communicate autonomously, is at stake: We need healthy, competitive, but also cooperating Internet Providers.

- "Protected data communication for autonomous and responsible players" is a scarce resource!

- SCION as a technology is good and getting better!

- But technology is not enough:
  The scarce resource "protected data communication" has to be cultivated and managed in a thoughtful and sustainable way!

Thank you for attention.

Building the
Secure Swiss Finance Network (SSFN)

Fritz Steinmann, SIX

Intro

- Who we are

- What we do

- Why SCION? Why SSFN?

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THIS IS SIX

- Exchanges
- Securities Services
- Financial Information
- Banking Services

INNOVATION

EMPLOYEES & EXPERTISE

STABILITY

RESPONSIBILITY

Four Areas of Activity.

One Company.

Exchanges

Third-largest stock exchange group in Europe

SIX Swiss Exchange, BME Exchange, BME Derivatives Exchange, SIX Digital Exchange
- Listing
- Trading
- Market Data

Securities Services

Unbeatable post-trade services from A to Z and more

- Clearing
- Settlement and Custody
- Securities Finance
- Tax Services
- Trade Repositories

Financial Information

Data You Trust
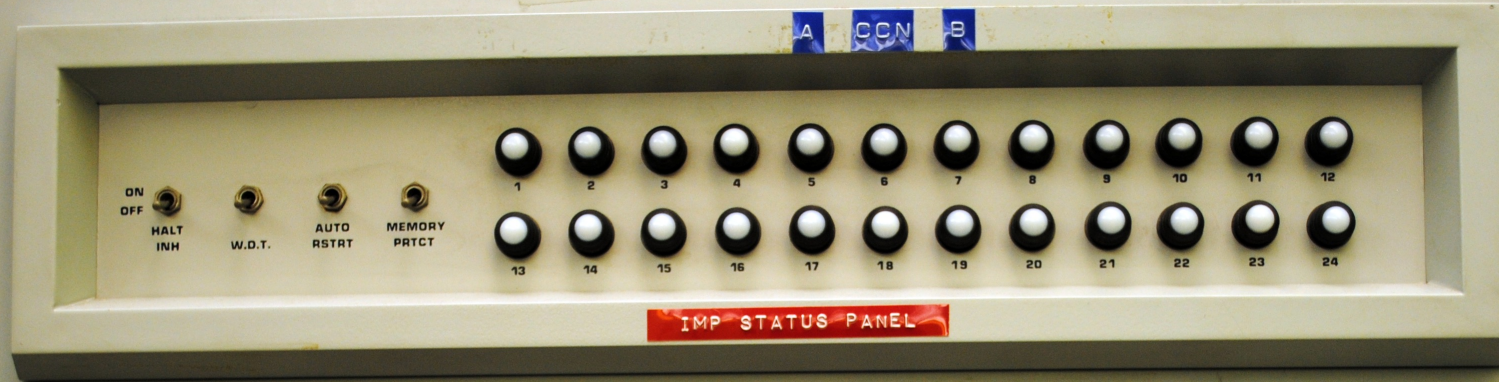
- Reference, Corporate Actions and Market Data
- Tax and Regulatory Services
- Indices
- ESG Data
- Display and Data Feed

Banking Services

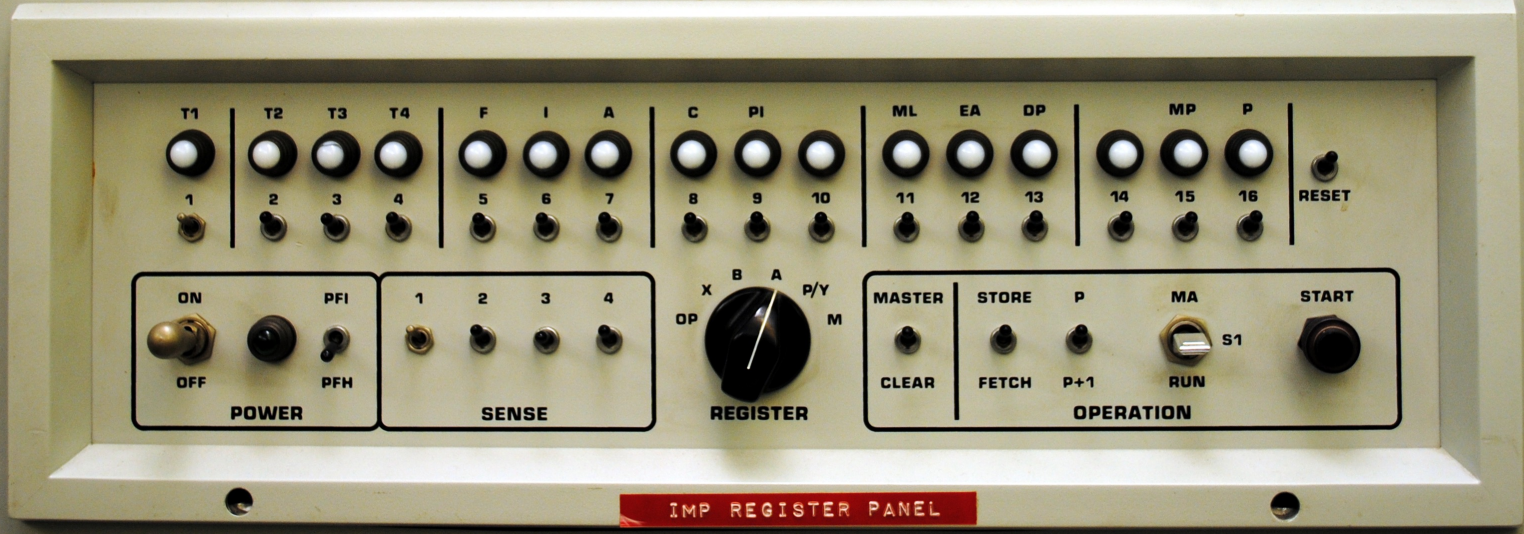*Smooth payment transactions*

- Cash
- Connectivity (Open Banking)
- Debit and Mobile Solutions
- Billing and Payments

SIX

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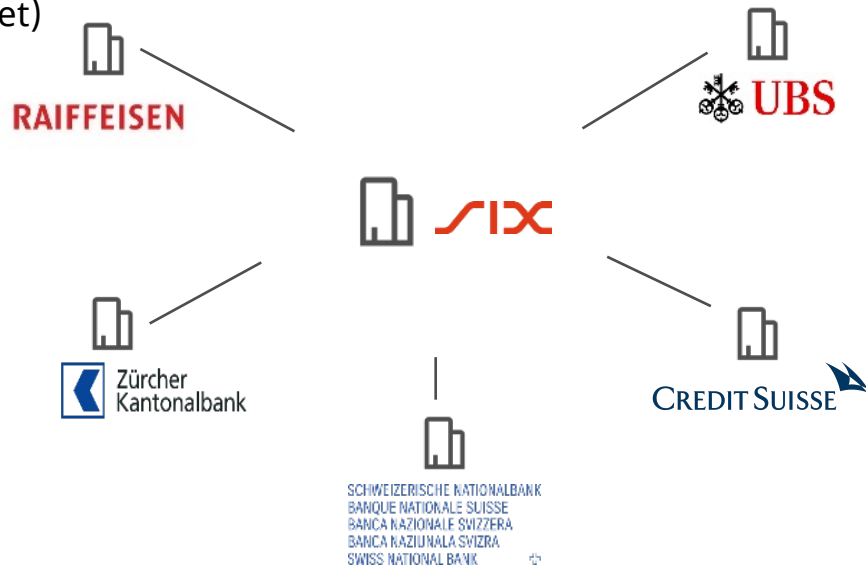
Traditional Interbank Network vs. SSFN

- **Private and isolated network**
- **Mainly focusing on central service provider**
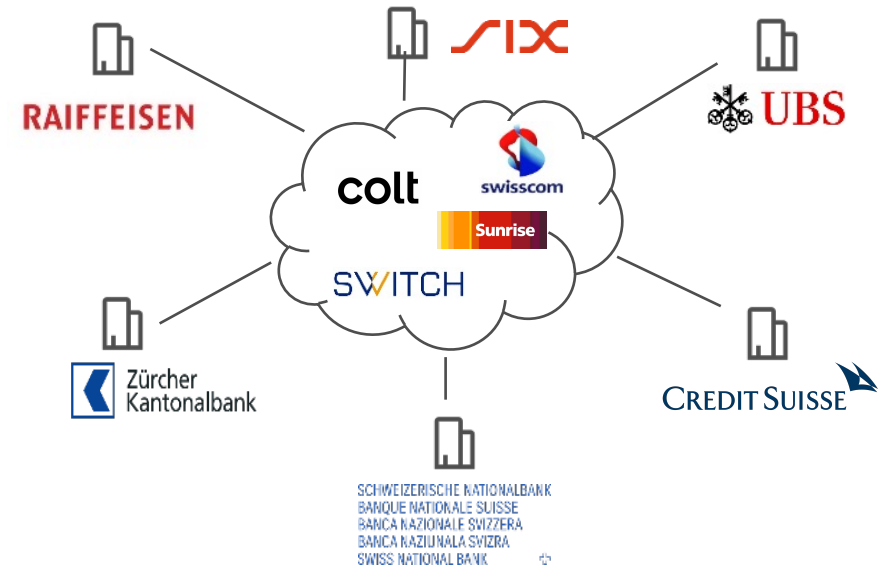- **Secure, but limited in network-oriented services**

SSFN

- **Protection against cyber risks**
- **Flexible any-to-any communication between participants**
- **Secure and resilient**

Centralized «Hub and Spoke» architecture (FinanceIP Net)

Community-based, «any-to-any» architecture

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Governance

- Trusted

- Distributed

- Enforceable

→Many traditional network technologies do not support this:

- SD-WAN – either a single carrier is chosen or a single solution vendor

- MPLS/P2P – similar obstacles

- New Internet architectures: brilliant ideas, but either not implemented or no transition path or both

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Governance

- Governance body is comprised of three individual parties

- The SSFN Governance defines the SSFN Rules & Regulations

- Service Providers must qualify

- Basic characteristics:

- Regulated interaction between users and service providers…

- …with rules defined by the governance…

- …but influenceable by users and service providers…

- …and decentralized like the Internet

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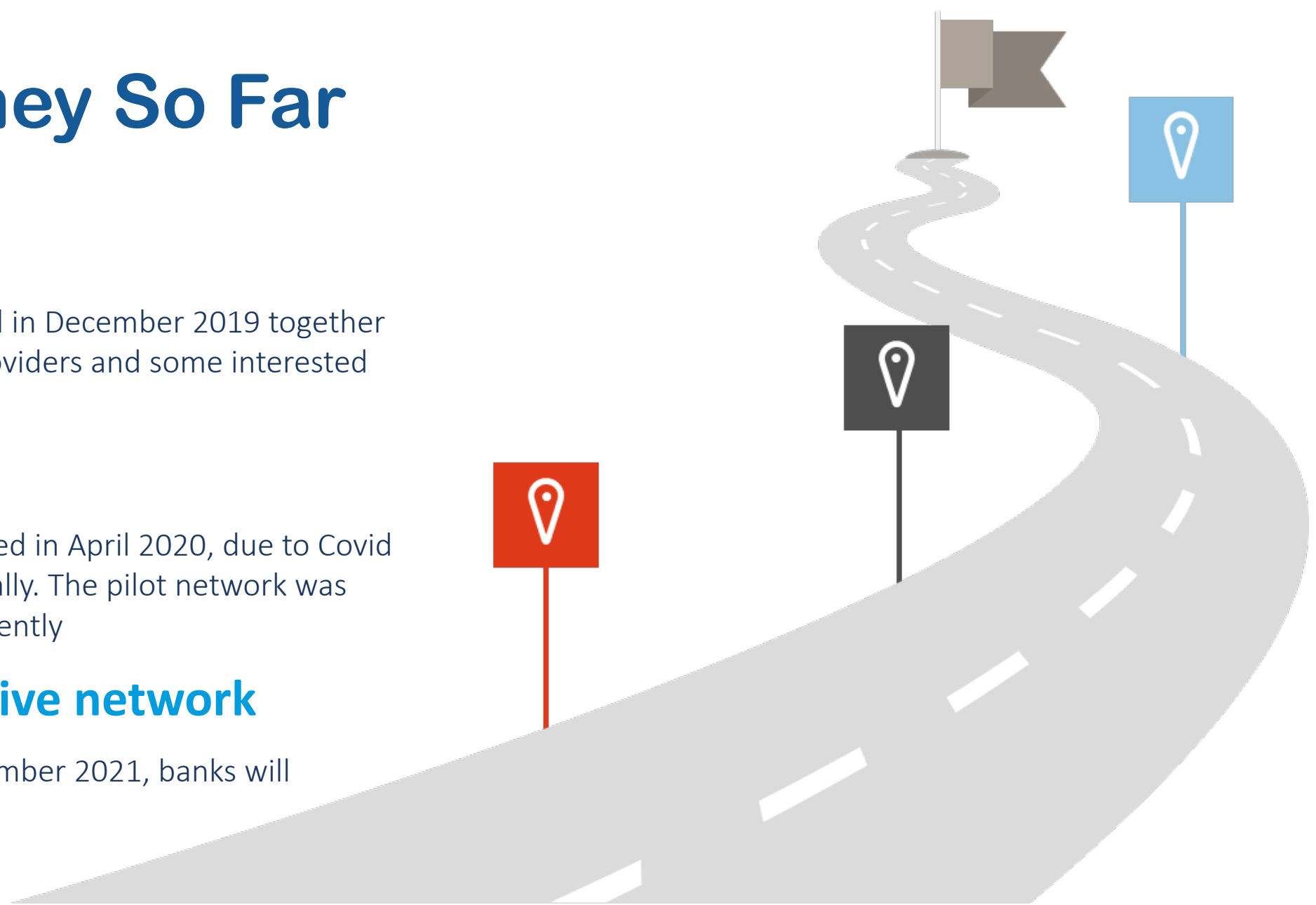
The Journey So Far

● **Project start**

The project was started in December 2019 together with ISP's, software providers and some interested banks

● **Pilot network**

The first TRC was created in April 2020, due to Covid it had to be done virtually. The pilot network was then enlarged subsequently

● **Production – Live network**

SSFN went live in November 2021, banks will migrate over time

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Outlook

- Explore new use cases
  - All Services run by SIX which are currently offered on private networks will be offered on SSFN
  - → Post-trading, Debit card, Financial Information services and many more

- Help foster other vertical ISD's
  - → Could be health care, government, energy sector, critical infrastructure...

- Boost SCION technology globally

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